

WHAT IS CLAIMED IS:

1. A signal driving system, comprising:
 - a first driver coupled to a first voltage supply,;
 - a first current mirror coupled to a second voltage supply, the second voltage supply having a higher voltage value than the first voltage supply, the first driver configured to push a signal through the first current mirror to an output node;
 - a first protection device coupled between the first driver and the current mirror;
 - a second protection device coupled between the current mirror and the output node;
 - a second current mirror coupled to ground;
 - a third protection device coupled between the output node and the second current mirror; and
 - a second driver coupled to a third voltage supply and to the second current mirror, the second driver configured to pull a signal from the output node.
2. The signal driving system of claim 1, wherein the first driver pushes the output signal from the first driver, through the first protection circuit, the first current mirror, the second protection circuit, and out the output node.
3. The signal driving system of claim 1, wherein the first voltage supply is substantially equal to the third voltage supply.
4. The signal driving system of claim 1, wherein the second driver pulls the output signal from the output node, through the third protection device, through the second current mirror, and to ground.

5. The signal driving system of claim 1, wherein the first and second protection devices are configured to maintain signals inside the first current mirror and first driver from crossing a threshold.

6. The signal driving system of claim 1, wherein the first voltage supply is approximately 1.2 Volts.

7. The signal driving system of claim 1, wherein the first voltage supply is approximately 2.5 Volts.

8. The signal driving system of claim 1, wherein the second voltage supply is approximately 3.3 Volts.

9. The signal driving system of claim 1, wherein the first driver comprises thin-oxide transistors having relatively low breakdown voltages.

10. The signal driving system of claim 1, wherein first driver comprises thin-oxide field effect transistors having relatively low breakdown voltages.

11. The signal driving system of claim 1, wherein first driver comprises thin-oxide n-type field effect transistors having relatively low breakdown voltages.

12. The signal driving system of claim 1, wherein the second driver comprises thin-oxide transistors having relatively low breakdown voltages.

13. The signal driving system of claim 1, wherein second driver comprises thin-oxide field effect transistors having relatively low breakdown voltages.

14. The signal driving system of claim 1, wherein second driver comprises thin-oxide p-type field effect transistors.

15. The signal driving system of claim 1, wherein the first, second, and third protection devices comprise thick-oxide transistors having relatively high breakdown voltages.

16. The signal driving system of claim 1, wherein the first, second, and third protection devices comprise thick-oxide field effect transistors having relatively high breakdown voltages.

17. The signal driving system of claim 1, wherein the first protection device comprises:

a pair of thick-oxide n-type field effect transistors having relatively high breakdown voltages; and

a pair of thick-oxide p-type field effect transistors having relatively high breakdown voltages.

18. The signal driving system of claim 1, wherein the second protection device comprises:

a pair of thick-oxide p-type field effect transistors having relatively high breakdown voltages.

19. The signal driving system of claim 1, wherein the third protection device comprises:

a pair of thick-oxide n-type field effect transistors having relatively high breakdown voltages.

20. The signal driving system of claim 1, wherein the first and second current mirrors comprise thick-oxide transistors.

21. The signal driving system of claim 1, wherein the first and second current mirrors comprise thick-oxide field effect transistors having relatively high breakdown voltages.
22. The signal driving system of claim 1, wherein the first and second drivers receive digital signals and output analog signals.
23. The signal driving system of claim 1, wherein the output analog signals comprise one of voltages and currents.
24. The signal driving system of claim 1, wherein the first and second drivers comprises current drivers.
25. The signal driving system of claim 1, further comprising at least a third voltage supply coupled to the first and second protection devices.
26. The signal driving system of claim 25, wherein the third voltage supply has a value of about 2.5 Volts.
27. The signal driving system of claim 1, further comprising a fourth voltage supply coupled to the second current mirror and the third protection device.
28. The signal driving system of claim 27, wherein the fourth voltage supply has a value of about 1 Volt.
29. The signal driving system of claim 1, wherein the signal driving system is configured to operate as a HIGHZ driver when one or more inputs of the first driver are pulled to ground and one or more inputs of the second driver are pulled to the third voltage supply.

30. The signal driving system of claim 1, wherein:
the first current mirror has a first current mirror ratio; and
the second current mirror has a second current mirror ratio,
such that the first and second current mirror ratios control a rise and fall time
of the signal flowing through the output node.
31. The signal driving system of claim 30, wherein the first and
second current mirrors comprise first and second sets of transistors and the
first and second current mirror ratios are based on a width to length ratio of the
first and second transistors, respectively.
32. The signal driving system of claim 22, wherein:
the received digital signals are complementary digital signals;
and
the output analog signals are differential analog signals.